

CLAIMS

What is claimed is:

1. A method of inspecting an active matrix substrate in which a plurality of pixel drive cells are arranged in a matrix, each of the pixel drive cells including a pixel select switching element and a capacitor connected to the pixel select switching element, the method comprising:

sequentially charging and discharging the capacitors of the pixel drive cells;

detecting a charging current at different points on a time axis, the charging current being based on charges stored in the capacitors by charging;

detecting a discharge current from the capacitors after discharging; and determining whether or not each of the pixel drive cells has a defect, based on the charging current detected at the different points and the discharge current.

2. The method of inspecting an active matrix substrate as defined in claim 1,

wherein the step of detecting the charging current includes adding up charging currents detected at the different points on a time axis.

3. The method of inspecting an active matrix substrate as defined in claim 2,

wherein the step of detecting the charging current is performed by using a plurality of first sample/hold circuits driven by a plurality of first sampling pulses which go active at the different points on a time axis.

4. The method of inspecting an active matrix substrate as defined in claim 3, wherein:

the step of detecting the discharge current is performed by using a second sample/hold circuit driven by a second sampling pulse which goes active after discharging; and

the determining step includes comparing an output from a common output line of the first sample/hold circuits with an output from the second sample/hold circuit by using a comparison circuit, and sampling an output from the comparison circuit by using a third sample/hold circuit driven by a third sampling pulse which goes active at a timing later than the second sampling pulse.

5. The method of inspecting an active matrix substrate as defined in claim 1,

wherein the step of charging and discharging is performed in one vertical scanning period.

6. The method of inspecting an active matrix substrate as defined in claim 1, wherein:

the step of charging and discharging is performed in a plurality of vertical scanning periods;

the step of detecting the charging current is performed at one of the different points in each of the vertical scanning periods;

the step of detecting the discharge current is performed once after discharging in each of the vertical scanning periods; and

the determining step includes comparing the charging current with the discharge current in each of the vertical scanning periods.

7. The method of inspecting an active matrix substrate as defined in claim 6, wherein:

the step of detecting the charging current is performed by using a first sample/hold circuit driven by first sampling pulses, the first sampling pulses in the vertical scanning periods being different from each other;

the step of detecting the discharge current is performed by using a second sample/hold circuit driven by a second sampling pulse which is common in the vertical scanning periods; and

the determining step includes comparing an output from the first sample/hold circuit with an output from the second sample/hold circuit in each of the vertical scanning periods by using a comparison circuit, and sampling an output from the comparison circuit by using a third sample/hold circuit driven by a third sampling pulse in each of the vertical scanning periods, the third sampling pulse going active at a timing later than the second sampling pulse.

8. The method of inspecting an active matrix substrate as defined in claim 6,

wherein the determining step is performed based on a mean value of the comparison results obtained in the vertical scanning periods.

9. The method of inspecting an active matrix substrate as defined in claim 6,

wherein the determining step is performed based on a sum of the comparison results obtained in the vertical scanning periods.

10. The method of inspecting an active matrix substrate as defined in claim 6,

wherein the determining step is performed based on a maximum value selected from among the comparison results obtained in the vertical scanning periods.

11. The method of inspecting an active matrix substrate as defined in claim 1,

wherein the pixel select switching elements are thin film transistors having various on-resistances in manufacturing.

12. A device for inspecting an active matrix substrate in which a plurality of pixel drive cells are arranged in a matrix, each of the pixel drive cells including a pixel select switching element and a capacitor connected to the pixel select switching element, the device comprising:

a charge/discharge circuit which sequentially charges and discharges the capacitors of the pixel drive cells;

a first detection circuit which detects a charging current at different points on a time axis, the charging current being based on charges stored in the capacitors by charging;

a second detection circuit which detects a discharge current from the capacitors after discharging; and

a determination circuit which determines whether or not each of the pixel drive cells has a defect, based on the charging current detected at the different points and the discharge current.

13. The device for inspecting an active matrix substrate as defined in claim 12, wherein:

the first detection circuit includes a plurality of first sample/hold circuits driven by a plurality of first sampling pulses which go active at the different points on a time axis;

the second detection circuit includes a second sample/hold circuit driven by a second sampling pulse which goes active after discharging; and

the determination circuit includes a comparison circuit which compares an output from a common output line of the first sample/hold circuits with an output from the second sample/hold circuit, and a third sample/hold circuit which is driven by a third sampling pulse which goes active at a timing later than the second sampling pulse and samples an output from the comparison circuit.

14. The device for inspecting an active matrix substrate as defined in claim 12, wherein:

the charge/discharge circuit sequentially charges and discharges the capacitors of the pixel drive cells in each of a plurality of vertical scanning periods;

the first detection circuit includes a first sample/hold circuit driven by first sampling pulses which are different from each other within the vertical scanning periods;

the second detection circuit includes a second sample/hold circuit driven by a second sampling pulse which is common in the vertical scanning periods; and

the determination circuit includes a comparison circuit which compares an output from the first sample/hold circuit with an output from the second sample/hold circuit in each of the vertical scanning periods, and a third

sample/hold circuit which is driven by a third sampling pulse which goes active at a timing later than the second sampling pulse and samples an output from the comparison circuit in each of the vertical scanning periods.